CLAIMS

What is claimed is:

1. An electrode for use in noninvasively measuring hematocrit, comprising:
a common contact area carrying two laterally discrete electrical contacts; and
at least two discrete elongate elements protruding from the common contact area, each elongate element carrying an electrode which is coextensive with a corresponding one of the at least two electrical contacts.

2. The electrode of claim 1, wherein a pair of elongate elements of the at least two elongate elements extends from the common contact area in substantially a common direction.

3. The electrode of claim 2, wherein the elongate elements of the pair are oriented substantially parallel to one another.

4. The electrode of claim 3, wherein the elongate elements of the pair have substantially the same width.

5. The electrode of claim 4, wherein the elongate elements of the pair are spaced apart from one another by a distance which is substantially the same as the width of each elongate element.

6. The electrode of claim 5, wherein the common contact area has a width equal to about four times the width of each elongate element.

7. The electrode of claim 6, wherein a gap between the elongate elements of the pair is positioned substantially centrally relative to the width of the common contact area.

8. The electrode of claim 1, comprising a dielectric layer forming at least a portion of the common contact area and each elongate element.

9. The electrode of claim 8, further comprising a conductive layer on the dielectric layer, the conductive layer forming at least portions of the at least two electrical contacts of the common contact area and the electrode of each elongate element.

10. The electrode of claim 9, further comprising a conductive coating layer over a portion of the conductive layer on each elongate element.

11. The electrode of claim 1, wherein the common contact area includes at least one aperture formed therethrough.

12. The electrode of claim 11, wherein the at least one aperture is elongate.

13. The electrode of claim 1, wherein each electrical contact extends over portions of both major surfaces of the common contact area.

14. A strip of electrodes, comprising two offset rows of at least partially overlapping electrode pairs, each electrode pair including:

a common contact area; and

a pair of spaced apart elongate elements extending from the common contact area and oriented substantially parallel to one another,

common contact areas of adjacent electrode pairs in the same row being positioned adjacent to one another and forming an edge of the strip,

elongate elements of electrode pairs in the same row being aligned with one another and oriented substantially parallel to each other,

adjacent elongate elements of each row being spaced apart by an elongate element of an electrode pair of the other row.

15. The strip of claim 14, wherein all of the elongate elements of the electrode pairs have substantially the same widths and are spaced apart from one another by a distance which is substantially equal to a width of each elongate element.

16. The strip of claim 14, comprising:

a substantially confluent dielectric layer;

a patterned conductive layer on the substantially confluent dielectric layer; and

a conductive coating layer over the patterned conductive layer only at locations of the strip that include the elongate elements.

17. The strip of claim 16, wherein the patterned conductive layer forms a pair of electrical contacts at the common contact area of each electrode pair and an electrode that communicates with a corresponding electrical contact and forms a part of each elongate element.

18. The strip of claim 16, wherein the substantially confluent dielectric layer includes at least one row of apertures formed through the common contact areas of each row of electrode pairs.

19. The strip of claim 18, wherein the substantially confluent dielectric layer includes two rows of apertures formed through the common contact areas of each row of electrode pairs.

20. The strip of claim 19, wherein the common contact area of each electrode pair is configured to be folded in half such that two apertures formed therethrough are aligned with one another and the pair of electrical contacts thereon are exposed to both major surfaces of the electrode pair.

21. A method for manufacturing electrodes to be used with a body part, comprising:

providing a laminate including a dielectric layer, a conductive layer substantially covering a surface of the dielectric layer, and a conductive coating layer over a portion of the conductive layer;

defining at least one common contact area and at least two separate elongate elements extending from the at least one common contact area; and

separating a portion of the conductive layer within the common contact area into at least two separate electrical contacts, each corresponding to and in electrical communication with portions of the conductive layer at the at least two separate elongate elements.

22. The method of claim 21, wherein providing comprises providing a strip including each of the dielectric layer, the conductive layer, and the conductive coating layer.

23. The method of claim 22, wherein defining comprises defining a plurality of common contact areas and at least two separate elongate elements extending from each common contact area.

24. The method of claim 23, wherein defining comprises defining at least two rows of common contact areas at two respective edges of the strip and the elongate elements at a center of the length of the strip, elongate elements that extend from common contact areas at a first edge of the strip being interleaved with elongate elements that extend from common contact areas at a second edge of the strip.

25. The method of claim 24, wherein providing comprises providing the laminate with the conductive coating layer being located only over portions of the conductive layer where the elongate elements are to be formed.

26. The method of claim 25, further comprising:

removing at least one group of electrodes, including a single common contact area and the elongate elements that extend therefrom, from the strip.

27. The method of claim 21, wherein defining and separating are effected substantially concurrently.

28. The method of claim 21, further comprising:

forming at least one aperture through the at least one common contact area.

29. The method of claim 21, further comprising folding the at least one contact area to expose portions of the conductive

30. An interface unit for use in a noninvasive hematocrit measurement system, comprising:

a monitoring element including:

a receptacle configured to at least partially receive a body part of a subject;

a plurality of electrical contacts configured to communicate with electrical contacts of electrodes to effect an electrical impedence measurement technique at the body part; and

a cover assembled with the monitoring element to at least partially enclose a portion of the body part within the receptacle of the body part and to establish contact between the electrical contacts of the monitoring element and the electrical contacts of the electrodes.

31. The interface unit of claim 30, wherein the monitoring element further includes:

at least one pressure port for controlling an amount of pressure applied by a pressurization component to the body part.

32. The interface unit of claim 30, wherein the monitoring element further includes:

at least one guide for facilitating proper orientation of at least one electrode over the receptacle.

32. The interface unit of claim 32, wherein the at least one guide comprises a protrusion.

33. The interface unit of claim 30, wherein the cover includes:

at least one pressure port for controlling an amount of pressure applied by a pressurization component to the body part.

34. The interface unit of claim 30, wherein the cover is hingedly secured to the monitoring element.

35. The interface unit of claim 30, wherein the cover includes:

a receptacle which is configured to communicate with the receptacle of the monitoring element upon assembly of the cover with the monitoring element.

36. The interface unit of claim 30, further comprising:

a locking element for locking the cover in place relative to the monitoring element when assembled therewith.

37. The interface unit of claim 30, wherein the monitoring element has a width to facilitate substantially unstrained placement of a finger of the subject on a side thereof while another finger of the subject is at least partially positioned within the receptacle.

38. A system for noninvasively measuring hematocrit of a subject, comprising:

an interface unit including:

a monitoring element including:

a receptacle configured to at least partially receive a body part of a subject;

a plurality of electrical contacts configured to communicate with electrical contacts of electrodes to effect an electrical impedence measurement technique at the body part; and

a cover configured to be assembled with the monitoring element to at least partially enclose a portion of the body part within the receptacle of the body part and to establish contact between the electrical contacts of the monitoring element and the electrical contacts of the electrodes;

a current generator in electrical communication with at least two electrical contacts of the plurality of electrical contacts of the monitoring element;

a voltage amplifier in electrical communication with at least two other electrical contacts of the plurality of electrical contacts of the monitoring element; and

a processing element in communication with at least the voltage amplifier.

39. The system of claim 28, wherein the processing element is also in communication with and is operable to control operation of the current generator.

40. The system of claim 38, further comprising:

a pressure source in communication with at least the receptacle of the monitoring element and configured to provide a positive pressure within the receptacle for application to a body part therein; and

a pressure transducer for monitoring a pressure applied by the pressure source.

41. The system of claim 40, wherein at least the pressure transducer is operably coupled with the processing element.

42. The system of claim 41, wherein the pressure source is also operably coupled with the processing element.

43. The system of claim 42, wherein the pressure source is operable under control of the processing element.

44. The system of claim 40, further comprising:

a valve positioned between the pressure source and the monitoring element for controlling an amount of pressure delivered to the receptacle of the monitoring element.

45. The system of claim 44, wherein operation of the valve is controlled by the processing element.

46. A pressurization component configured for use with a body part, comprising:

a bladder including pair of walls with peripiheries mutually secured in air-tight fashion to one another; and

an inlet that comprises a conduit protruding from at least one wall of the pair.

47. The pressurization component of claim 46, further comprising a reinforcing base surrounding a base of the inlet and secured to the at least one wall.

48. The pressurization component of claim 46, wherein the bladder is elongate.

49. The pressurization component of claim 46, further comprising:

another bladder including a pair of walls with peripheries mutually secured in air-tight fashion to one another, interiors of the bladder and the another bladder in communication with one another.

50. The pressurization component of claim 49, further comprising:

a tube that establishes communication between the interiors of the bladder and the another bladder.

51. The pressurization component of claim 50, further comprising:

reinforcing bases at ends of the tube and secured to walls of the bladder and the another bladder.